



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,591	05/19/2005	Jan-Willem Van De Waerd	US02 0465 US	7635

65913 7590 11/20/2008
NXP, B.V.
NXP INTELLECTUAL PROPERTY DEPARTMENT
M/S41-SJ
1109 MCKAY DRIVE
SAN JOSE, CA 95131

EXAMINER

CYGIEL, GARY W

ART UNIT	PAPER NUMBER
----------	--------------

2188

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

11/20/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No. 10/535,591	Applicant(s) VAN DE WAERDT ET AL.	
	Examiner GARY W. CYGIEL	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. Claim 16 is objected to under 37 CFR 1.75 as being a duplicate of claim 2.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 4-8, 10-14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sherwood et al. [**NPL:Predictor-Directed Stream Buffers**] (hereinafter referred to as Sherwood).

Consider **Claim 1**,

Sherwood teaches a method of data retrieval comprising the steps of:

providing a first memory circuit (**Fig 3**);

providing a stride prediction table (SPT) (**Fig 3, Sec 4.2**);

providing cache memory circuit (**Fig 3**);

Art Unit: 2188

executing instructions for accessing data within the first memory (**Instructions must be executed to access data within the first memory.**);

detecting a cache miss (**Sec 4.3 ¶3, detects two cache misses in a row**); and
accessing and updating the SPT only when a cache miss is detected (**Sec 4.3 ¶3m, two-miss allocation filter.**).

Consider **Claims 2 and 16**,

Sherwood teaches a method according to claim 1 wherein the cache memory circuit is a stream buffer (**Fig 3**).

Consider **Claim 4**,

Sherwood teaches a method according to claim 1 wherein the cache memory circuit and the
SPT are within a same physical memory space (**Fig 3**).

Consider **Claim 5**,

Sherwood teaches a method according to claim 1 wherein the first memory is an external
memory circuit separate from a processor executing the instructions (**Fig 3, data line from/to next lower level of memory.**).

Consider **Claims 6 and 7**,

Art Unit: 2188

Sherwood teaches a method according to claim 1 wherein the step of detecting a cache miss

includes the steps of:

determining whether an instruction to be executed by the processor is a memory access instruction;

when the instruction is a memory access instruction, determining whether data at a memory location of the memory access instruction is present within the cache; and,

when the data is other than present within the cache, detecting a cache miss, and accessing and updating the SPT only when the cache miss has occurred (**Sec 4.3 ¶3, a cache miss occurs when a requested memory line is not in the cache, therefore requiring the first two limitations of these claims.**).

Consider **Claim 8**,

Sherwood teaches a method according to claim 1, wherein the step of accessing provides a step of filtering that prevents unnecessary access and updates to entries within the SPT (**Sec 4.3**).

Consider **Claim 10**,

Sherwood teaches a method according to claim 1, wherein the SPT comprises an address field, and where a size of the address field is less than an address space used to index the SPT (**Sec 4.2 ¶5, Table tag size can be reduced by storing only**

Art Unit: 2188

partial address tags.).

Consider **Claim 11**,

Sherwood teaches an apparatus comprising:

a stride prediction table (SPT) (**Fig 3,Sec 4.2**); and

a filter circuit for use with the SPT, the filter circuit for determining instance wherein the SPT is to be accessed and updated, the instances only occurring when a cache miss is detected (**Sec 4.3 ¶3**).

Consider **Claim 12**,

Sherwood teaches an apparatus according to claim 11 comprising a memory circuit, the memory circuit for storing the SPT therein (**Fig 3**).

Consider **Claim 13**,

Sherwood teaches an apparatus according to claim 12 comprising a cache memory, the cache memory residing within the memory circuit (**Fig 3**).

Consider **Claim 14**,

Sherwood teaches an apparatus according to claim 13, wherein the memory circuit is a single ported memory circuit (**Fig 3, Markov Predictor has single input and single output, Handling a single request at a time.**).

Art Unit: 2188

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 3, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherwood et al. [**NPL:Predictor-Directed Stream Buffers**] (hereinafter referred to as Sherwood) in view of Handy [**NPL: the Cache Memory book**] (hereinafter referred to as Handy).

Consider **Claim 3, 9 and 15**,

Sherwood teaches a method according to claim 1 or 13 respectively, but does not specifically disclose all the details regarding the circuits construction.

Handy does teach these limitations such as:

wherein the cache memory circuit is a random access cache memory

(Handy:Page 28, SRAM cell used in internal cache.)

wherein the cache memory circuit is integral with the processor executing the instructions **(Handy:Page 28, CPU on same chip as on-chip cache.)**.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the circuit construction concepts as taught by Handy in the system of Sherwood because they are notoriously well known concepts in the art. The use of these methods constitutes only design choice and has no novelty in the art.

Response to Arguments

7. Applicant's arguments filed 10 December 2007 have been fully considered but they are not persuasive.

[A] Re: Stride Prediction Table

The applicant argues that he was unable to identify the stride prediction table from the cited portions of the Sherwood reference. The examiner cited Figure 3 and Section 4.2, Figure 3 shows a "stride predictor" and further describes that "[w]hen a stream buffer is allocated it is assigned a fixed stride from the stride-pc table" [Emphasis added]. In addition, section 4.2 explicitly describes that "[i]n the write-back stage, the load-PC (for a missed load) is used to index into the stride table" [Emphasis added]. The cited portions of Sherwood clearly teach the elements of a stride table to a person of ordinary skill in the art.

[B] Re: Accessing and updating the SPT only when a cache miss is detected.

The applicant argues that the Sherwood reference does not limit access to the SPT. However, the claim language is requires that "accessing and updating" the SPT

Art Unit: 2188

only when a cache miss is detected. The claim language in no way requires that normal accesses are limited.

[C] Re: Office action identifies stream buffers as the cache.

The office action points to the stream buffer to teach a "cache memory circuit" [Emphasis added] as required by the claim language.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GARY W. CYGIEL whose telephone number is (571)270-1170. The examiner can normally be reached on Monday through Thursdays 12:00pm-2:00pm EST.

Art Unit: 2188

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571)272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hyung S. Sough/
Supervisory Patent Examiner, Art Unit 2188
11/17/08

/Gary W Cygiel/
Examiner
Art Unit 2188

GWC 11/13/2008